

REMARKS/ARGUMENTS

Claims 1-3 and 5-19 are pending, claims 16-18 having been withdrawn from consideration. By this Amendment, claim 4 is cancelled, and claims 1-3, 5-15 and 19 are amended. Support for the amendments to claims 1-3, 5-15 and 19 can be found, for example, in the present specification at page 4, lines 5 to 37, and in original claims 1-3, 5-15 and 19. No new matter is added. In view of the foregoing amendments and following remarks, reconsideration and allowance are respectfully requested.

Personal Interview

Applicants appreciate the courtesies extended to Applicants' representative by Examiner Weddle during the October 21, 2008 Personal Interview. Applicants' separate record of the substance of the interview is incorporated in the following remarks.

Restriction Requirement

Applicants provisionally elected claims 1-15 and 19 with traverse in response to a telephone Restriction Requirement on September 8, 2008. Applicants hereby affirm their election of claims 1-15 and 19 with traverse.

Applicants submit that the Office Action fails to carry its burden in demonstrating that the claims of Group I and Group II are not related to a single general inventive concept. Moreover, Applicants submit that the claims of Group I and Group II are sufficiently related that search for the subject matter of the claims of Group I would necessarily encompass search for the subject matter of the claims of Group II. *See MPEP §803*, which states "[i]f the search and examination of an entire application can be made without a serious burden, the Examiner must examine it on the merits, even though it includes claims to distinct or independent

inventions." Accordingly, to avoid the time and expense of duplicative examination, reconsideration and withdrawal of the restriction requirement are respectfully requested.

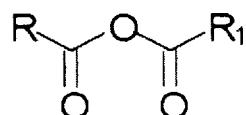
For the reasons set forth below, Applicants submit that all pending claims presently subject to examination are in condition for allowance. Because withdrawn claims 16-18 depend from, and thus recite all features of, allowable claim 1, rejoinder and allowance of claims 16-18 are respectfully requested.

Rejections Under 35 U.S.C. §103

A. Li and Vaca-Garcia

The Office Action rejects claims 1-12, 14 and 15 under 35 U.S.C. §103(a) over Li et al., "Chemical modification of wood by anhydrides without solvents or catalysts," ("Li") in view of Vaca-Garcia et al., "Cellulose esterification with fatty acids and acetic anhydride in lithium chloride/N,N-dimethylacetamide medium," ("Vaca-Garcia"). By this Amendment, claim 4 is cancelled, rendering the rejection moot as to that claim. As to the remaining claims, Applicants respectfully traverse the rejection.

Claim 1 recites "[a] process for chemical treatment of at least one lignocellulose material, comprising: impregnating the lignocellulose material with a chemical agent comprising hydrocarbonaceous chains: wherein: the agent comprises a mixed anhydride, given by the formula:



where R is a first hydrocarbonaceous chain and R₁ is a second hydrocarbonaceous chain different from the first hydrocarbonaceous chain, except that when either of R or R₁ is a hydrocarbonaceous chain derived from acetic acid, the other of R and R₁ is not a

hydrocarbonaceous chain derived from benzoic acid; and the agent is capable of providing covalent grafting of a plurality of the hydrocarbonaceous chains to the lignocellulose material" (emphasis added). Li and Vaca-Garcia do not disclose or suggest such a process.

As indicated above, claim 1 requires that particular mixed anhydrides are applied to lignocellulose materials. The Office Action asserts that Li discloses treating lignocellulose materials with anhydrides. *See* Office Action, page 5. The Office Action concedes that Li does not disclose treating lignocellulose materials with mixed anhydrides, but asserts that it would have been obvious to employ such mixed anhydrides in view of the teachings of Vaca-Garcia. *See* Office Action, pages 5 to 6. Notwithstanding these assertions, the combination of Li and Vaca-Garcia would not have rendered claim 1 obvious.

Vaca-Garcia discloses a process in which cellulose is esterified using mixed anhydrides in a homogeneous liquid system (i.e., isolated cellulose dissolved in a solvent is treated with a liquid agent). *See* Vaca-Garcia, Abstract, pages 315 to 316. The obtained cellulose esters, after precipitation, include two different types of aliphatic chains, including a fatty acid-derived aliphatic chain. *See* Vaca-Garcia, Abstract. Because of the presence of the fatty acid-derived aliphatic chain, the isolated cellulose possesses hydrophobicity. *See* Vaca-Garcia, page 318. While the treatment of Vaca-Garcia is indicated to provide benefits, one of ordinary skill in the art would have no reason to conclude that such treatment would be applicable or efficient in a heterogeneous system (e.g., a system in which a solid lignocellulose material is treated with a liquid agent).

Li discloses a process in which wood is esterified under heterogeneous conditions (i.e., solid wood is treated with a liquid agent) with a symmetrical anhydride. *See* Li, page 216. As a result, the treated wood possesses a single type of relatively short aliphatic chains (i.e., less than C₆). In fact, Li teaches that reactivity is poor when carbonaceous chains having 6 or more carbons are used. In particular, Li indicates that a C₆ anhydride requires treatment

for 25 hours at 140°C to obtain a treated product having dimensional stability similar to that of a product obtained by acetylation (C₂). *See Li*, page 219. If a wood product is treated for less than 10 hours with a C₆ anhydride, no significant dimensional stability is obtained. *See Li*, page 216. That is, *Li* teaches away from using reactants having long carbonaceous chains of the type described in Vaca-Garcia. *See MPEP §2141.02* (citing *W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540 (Fed. Cir. 1983)) (stating that a prior art reference must be considered in its entirety, i.e., as a whole, including portions that would lead away from the claimed invention).

Applicants further note that the method of *Li* employs pre-extraction with benzene, ethanol and acetone to prime wood samples for grafting. *See Li*, page 216. Further, during treatment in *Li*, wood samples are packed in plastic films and aluminum to maintain reactivity in the wood samples and to facilitate the involved reaction. *See Li*, page 216. That is, *Li* discourages using reactants such as in Vaca-Garcia even under these enhanced and inefficient conditions.

As is well-settled, a *prima facie* case of obviousness based on a proposed modification to a reference (e.g., replacing the anhydrides in the method of *Li* with the acetic anhydride and fatty acid combination of Vaca-Garcia) will only stand if one of ordinary skill would have had a reasonable expectation of success upon making the modification. *See, e.g.*, MPEP §2143.02 (citing *In re Merck & Co., Inc.*, 800 F.2d 1091 (Fed. Cir. 1986)). For the reasons discussed above, one of ordinary skill in the art would have had no reason to expect that the treatment techniques for dissolved cellulose in Vaca-Garcia would be suitable in the wood treatment method of *Li*. A *prima facie* case of obviousness has not been made.

By the process of claim 1, it is possible to graft fatty acid-derived hydrocarbonaceous chains to lignocellulose materials, such as wood. The grafting can be carried out under heterogeneous conditions (e.g., treating a solid wood block with a liquid agent) without

employing pretreatments, catalysts, solvent extraction, etc. Moreover, the treatment can be carried out under moderated conditions (e.g., at temperatures of less than 140 °C for a period of 30 minutes or less). The process of claim 1 makes it possible to provide water repellency and dimensional stability, results that are not possible with the methods of the cited references. Li and Vaca-Garcia do not disclose or suggest the particular combination of features of the process of claim 1, or recognize the benefits stemming therefrom.

As explained, claim 1 would not have been rendered obvious by Li and Vaca-Garcia. Claims 2, 3, 5-12, 14 and 15 depend from claim 1 and, thus, also would not have been rendered obvious by Li and Vaca-Garcia. Accordingly, reconsideration and withdrawal of the rejection are respectfully requested.

B. Li, Vaca-Garcia and Mahieu

The Office Action rejects claim 13 under 35 U.S.C. §103(a) over Li in view of Vaca-Garcia and EP 0 190 576 A1 to Mahieu ("Mahieu"). Applicants respectfully traverse the rejection.

For the reasons discussed above, Li and Vaca-Garcia fail to disclose or suggest each and every feature of claim 1. Mahieu does not remedy the deficiencies of Li and Vaca-Garcia. Mahieu is cited for its alleged disclosure of treating wood elements by spraying. See Office Action, page 8. However, Mahieu, like Li and Vaca-Garcia, fails to disclose or suggest treating a lignocellulose material with a mixed anhydride as recited in claim 1. Accordingly, the combination of references fails to disclose or suggest each and every feature of claim 1.

As explained, claim 1 would not have been rendered obvious by Li, Vaca-Garcia and Mahieu. Claim 13 depends from claim 1 and, thus, also would not have been rendered

obvious by Li, Vaca-Garcia and Mahieu. Accordingly, reconsideration and withdrawal of the rejection are respectfully requested.

B. Li, Vaca-Garcia and Dawson

The Office Action rejects claim 19 under 35 U.S.C. §103(a) over Li in view of Vaca-Garcia and Dawson et al., "Reactivity of radiate pine sape wood toward carboxylic acid anhydrides," ("Dawson"). Applicants respectfully traverse the rejection.

For the reasons discussed above, Li and Vaca-Garcia fail to disclose or suggest each and every feature of claim 1. Dawson does not remedy the deficiencies of Li and Vaca-Garcia. Dawson is cited for its alleged disclosure of treating pine with carboxylic acid anhydrides. *See* Office Action, page 9. However, Dawson, like Li and Vaca-Garcia, fails to disclose or suggest treating a lignocellulose material with a mixed anhydride as recited in claim 1. Accordingly, the combination of references fails to disclose or suggest each and every feature of claim 1.

As explained, claim 1 would not have been rendered obvious by Li, Vaca-Garcia and Dawson. Claim 19 depends from claim 1 and, thus, also would not have been rendered obvious by Li, Vaca-Garcia and Mahieu. Accordingly, reconsideration and withdrawal of the rejection are respectfully requested.

Conclusion

For the foregoing reasons, Applicants submit that claims 1-3 and 5-19 are in condition for allowance. Prompt reconsideration and allowance are respectfully requested.

Respectfully submitted,

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